JbigDeaL JbigDeaL JbigDeaL JbigDeaL
Download from www.JbigDeaL.in Powered By © JbigDeaL™

Answer Keys Physics 2009

1. The Galaxy,in which we live is

(a) Milkyway (b) Radio galaxy

(c) Spiral Galaxy (d) None of these

2. The equation of state of the gas is expressed as $(P+\frac{a}{V^2})(V-b) = nRT$, where p=pressure,V=volume ,T=temperature and n,a,b,R are constants.The dimensions of a will be

(a) $[MLT^{-1}]$ (b) $[ML^5T^{-2}]$

(c) $[L^{-3}]$ (d) $[L^6]$

3. The dimensional formula of modules of rigidity is

(a) $[ML^{-2}T^{-2}]$ (b) $[ML^{-3}T^{-2}]$

(c) $[ML^2T^{-2}]$ (d) $[ML^{-1}T^{-2}]$

4. 1 ns is defined as

(a) 10^{-9} s of Kr-clock of 1650763.73 oscillations

(b) 10^{-9} s of Kr-clock of 652189.63 oscillations

(c) 10^{-9} s of Cs-clock of 1650763.73 oscillations

(d) 10^{-9} s of Cs-clock of 9192631770 oscillations

5. If the angle between two vectors $\vec{a}$ and $\vec{b}$ is 120^0 ,its resultant C will be

(a) $C = {}^0 A-B {}^0$ (b) $C < {}^0 A-B {}^0$

(c) $C > {}^0 A-B {}^0$ (d) $C = {}^0 A+B {}^0$

6. The direction of $\vec{A}$ is vertically upward and direction of $\vec{B}$ is in north direction .The direction of $\vec{A}x\vec{B}$ will be

(a) western direction

(b) eastern direction

(c) at 45^0 upward in north

(d) vertically downward

JbigDeaL JbigDeaL JbigDeaL JbigDeaL Download from www.JbigDeaL.in Powered By © JbigDeaL JbigDeaL JbigDeaL JbigDeaL JbigDeaL

JbigDeaL JbigDeaL JbigDeaL JbigDeaL
Download from www.JbigDeaL.in Powered By © JbigDeaL™

7. If $\vec{A} = \vec{B} + \vec{C}$ and values of A, B and C are 13,12 and 5 respectively,then the angle between $\vec{A}$ and $\vec{C}$ will be

(a) $\cos^{-1}(5/13)$ (b) $\cos^{-1}(13/12)$

(c) $\pi/2$ (d) $\sin^{-1}(5/12)$

8. A car is circulating on the path of redius rand at any time its velocity is v and rate of increase of velocity is a.The resultant acceleration of the car will be

(a) $\sqrt{\frac{v^2}{a^2}+r^2}$ (b) $\sqrt{\frac{v^2}{r}+a}$

(c) $\sqrt{\frac{v^4}{r^2}+a^2}$ (d) $\left(\sqrt{\frac{v^2}{r}+a}\right)$

9. A particle of mass m is being circulated on a circle of redius r.If the speed of particle at the highest point be v,then

(a) $mg=\frac{mv^2}{r}$ (b) $mg>\frac{mv^2}{r}$

(c) $mg<\frac{mv^2}{r}$ (d) $mg\geq\frac{mv^2}{r}$

10. A particle of mass m is being circulated on a vertical circle of redius r having angular momentum L,then the centripetal force will be

(a) L^2/mr (b) L^2m/r

(c) L^2/mr^3 (d) L^2/mr^2

11. A uniform disc of mass 2 kg and redius 15 cm is revolving around the central axis by 4 red-s^{-1} .The lenear momentum of disc will be

(a) 1.2 kg-ms^{-1} (b) 1.0 kg-ms^{-1}

(c) 0.6 kg-ms^{-1} (d) None of these

12. If the torque of the rotational motion be zero,then the constant quantity will be

(a) angular momentum

(b) linear momentum

(c) angular acceleration

(d) centripetal acceleration

13. What will be the charge in acceleration due to gravity when earth shrinks by 1% to its redius ?

JbigDeaL JbigDeaL JbigDeaL JbigDeaL Download from www.JbigDeaL.in Powered By © JbigDeaL JbigDeaL JbigDeaL JbigDeaL JbigDeaL

JbigDeaL JbigDeaL JbigDeaL JbigDeaL
Download from www.JbigDeaL.in Powered By © JbigDeaL™

(a) Increase by 1% (b) Increase by 2%

(c) Decrease by 1% (d) None of these

14. If g be the acceleration due to gravity at the earth surface,then what will be the increase in potential energy if object of mass m is raised by its redius R ?

(a) $\frac{1}{2}$mgR (b) 2mgR

(c) mgR (d) $\frac{1}{4}$ mgR

15. A satellite is revolving around the planet.The gravitational force between them varies with $R^{-5/2}$, where R is the redius of the satellite.The square of the time period T will be directly proportional to

(a) R^3 (b) $R^{7/2}$

(c) $R^{3/2}$ (d) $R^{5/7}$

16. The required kinetic energy of an object of mass m,so that it may escape,will be

(a) $\frac{1}{4}$mgR (b) $\frac{1}{2}$mgR

(c) mgR (d) 2mgR

17. A car of mass mis driven with an acceleration a along a straight level road against a constant external resistive force R.When the velocity of the car is v,the rate at which engine of thecar is doing work,will be

(a) R.v (b) ma.v

(c) (R+ma).v (d) (ma-R).v

18. For a real gas (van der Waals' gas)

(a) Boyle temperature is a/Rb

(b) Critical temperature is a/Rb

(c) Triple temperature is 2a/Rb

(d) Inversion temperature is a/2Rb

19. If the electric flux entering and leaving an enclosed surface respectively is ϕ_1 and ϕ_2,the electric charge inside the surface will be

(a) $(\phi_1 - \phi_2)\varepsilon_0$ (b) $(\phi_2 - \phi_1)\varepsilon_0$

(c) $(\phi_1 + \phi_2)/\varepsilon_0$ (d) $(\phi_2 - \phi_1)/\varepsilon_0$

JbigDeaL JbigDeaL JbigDeaL JbigDeaL Download from www.JbigDeaL.in Powered By © JbigDeaL JbigDeaL JbigDeaL JbigDeaL JbigDeaL

JbigDeaL JbigDeaL JbigDeaL JbigDeaL
Download from www.JbigDeaL.in Powered By © JbigDeaL™

20. The binary Coded decimal (BCD) equivalent of 429 is

(a) 111001110 (b) 010000101001

(c) 110101101 (d) 0100101001

21. The dispersive power of a plane transmission diffraction

(a) increases with increase in order of diffraction

(b) decreases with increase in angle of diffraction

(c) decreases with increase in area of ruled surface

(d) depends upon the material

22. The proper life of pion (®$^{+}$)is 2.5x10^{-8} s.In a beam of points travelling with a speed of 0.9 c,the pion ,in the labrotary frame,can travel a maximum distance of

(a) 6.75 m (b) 15.49 m

(c) 7.50 m (d) 17.10 m

23. The satisfactory theory of Brownian motion was invented by

(a) Brown (b) Carnot

(c) Einstein (d) Maxwell

24. Which of the following is not the main characteristic of LASER beam ?

(a) High irradiance

(b) High divergence

(c) Highly monochromatic

(d) Highly coherent

25. The characteristic impedence (Z_0) of free space is

(a) 377 t (b) 357 t

(c) 100 t (d) 1000 t

26. The energy of a particle in-one dimensional square potential well (n being the principal quantam number) is

(a) E ó n (b) E ó n^2

JbigDeaL JbigDeaL JbigDeaL JbigDeaL Download from www.JbigDeaL.in Powered By © JbigDeaL JbigDeaL JbigDeaL JbigDeaL JbigDeaL

JbigDeaL JbigDeaL JbigDeaL JbigDeaL
Download from www.JbigDeaL.in Powered By © JbigDeaL™

(c) E ó $\frac{1}{n}$ (d) E ó $\frac{1}{n^2}$

27. The phase velocity (v_p) of travelling wave is

(a) $v_p = \mu/k$ (b) $v_p = d\mu/dk$

(c) $v_p = c$ (d) $v_p = c/v_g$

28. The values of L,C and R for the circuit are 1H,9F and 3 t .What is the quality factor for the circuit at resonace ?

(a) 1 (b) 9 (c) $\frac{1}{9}$ (d) $\frac{1}{3}$

29. Curie law ¡ ^{T} = constant,relating magnetic susceptibility (¡) and absolute temperature (T) of magnetic substances,is obyed by

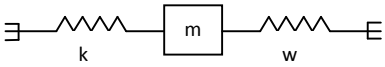
(a) all magnetic substances

(b) paramagnetic substance

(c) diamagnetic substance

(d) None of these

30. The normal mode of vibration of the given spring mass system may have the frequency



(a) $\frac{1}{2\pi}\sqrt{\frac{k}{m}}$

(b) $\frac{1}{2\pi}\sqrt{\frac{2k}{m}}$

(c) $\frac{1}{2\pi}\sqrt{\frac{k}{2m}}$

(d) $2\pi\sqrt{\frac{k}{m}}$

31. Cathode rays enter a magnetic field making oblique angle with lines of magnetic induction.What will be the nature of the path followed ?

(a) parabola (b) helix

(c) circle (d) straight line

JbigDeaL JbigDeaL JbigDeaL JbigDeaL Download from www.JbigDeaL.in Powered By © JbigDeaL JbigDeaL JbigDeaL JbigDeaL JbigDeaL

JbigDeaL JbigDeaL JbigDeaL JbigDeaL
Download from www.JbigDeaL.in Powered By © JbigDeaL™

32. The spin-orbit interaction has no effect in the level of the hydrogen atom

(a) s-level (b) p-level

(c) d-level (d) f-level

34. In the cublic crystal,the spacing of various crystal planes $d_{100} : d_{111}$ in sample cublic is

(a) 1:1:1 (b) $1:\frac{1}{\sqrt{2}}:1$

(c) $1:1:\frac{1}{\sqrt{2}}$ (d) $1:\frac{1}{\sqrt{2}}:\frac{1}{\sqrt{3}}$

34. What is the angle between the bonds of of different carbon atoms of diamond lattice ?

(a) 60^0 (b) 90^0

(c) 120^0 (d) None of these

35. The average energy of classical oscillator is

(a) kT (b) $\frac{1}{2}$kT

(c) $\frac{3}{2}$kT (d) $(kT)^2$

36. The average energy of classical oscillator is

(a) hv (b) $\frac{h\nu}{(e^{\frac{h\nu}{kt}}-1)}$

(c) $\frac{h\nu}{(e^{\frac{h\nu}{kt}}+1)}$ (d) kT

37. name of p-n junction,which can be used as the regulator,is

(a) zener diode (b) tunnel diode

(c) gunn diode (d) None of these

38. Name of a p-n junction,which can be used as the regulator is

(a) zener diode (b) tunnel diode

(c) gunn diode (d) None of these

39. A pulse or a wave train travels along a stretched string and reaches the fixed end of the string.It will be reflected back with

(a) the same phase as the incident pulse but with velocity reversed

JbigDeaL JbigDeaL JbigDeaL JbigDeaL Download from www.JbigDeaL.in Powered By © JbigDeaL JbigDeaL JbigDeaL JbigDeaL JbigDeaL

JbigDeaL JbigDeaL JbigDeaL JbigDeaL
Download from www.JbigDeaL.in Powered By © JbigDeaL™

(b) a phase change of 180^0 with no reversal of velocity

(c) the same phase as the incident pulse with no reversal of velocity

(d) a phase change of 180^0 with velocity reversed

40. A nucleus of an atom consists of

(a) electrons and protons

(b) electrons,protons and neutrons

(c) electrons and neutrons

(d) neutrons and protons

41. The hollow shaft is ….. than a solid shaft of same mass,material and length.

(a) less stiff (b) more stiff

(b) equally stiff (d) None of these

42. A laser beam is used for carrying out surgery because it

(a) is highly moniochroatic

(b) is highly coherent

(c) is highly directional

(d) can be sharply focused

43. The position vector of a point is $\vec{R} = x\hat{i} + y\hat{j} + z\hat{k}$ and other vector is $\vec{A} = 3\hat{i} + 2\hat{j} + 5\hat{k}$.Which of the mathematical relations is correct ?

(a) d'($\vec{A}.\vec{R}$) = 0 (b) d'($\vec{A}.\vec{R}$) = $\vec{A}$

(b) d'($\vec{A}.\vec{R}$) = $\vec{R}$ (d) None of these

44. A body is at rest on the surface of the earth .Which of the following statements is correct ?

(a) No force is acting on the body

(b) Only weight of the body acts on it

(c) Net downward force is equal to the net upward force

(d) None of the above statement is correct

JbigDeaL JbigDeaL JbigDeaL JbigDeaL Download from www.JbigDeaL.in Powered By © JbigDeaL JbigDeaL JbigDeaL JbigDeaL JbigDeaL

JbigDeaL JbigDeaL JbigDeaL JbigDeaL
Download from www.JbigDeaL.in Powered By © JbigDeaL™

45. A solid sphere of mass M and redius R has a spherical cavity of radius $\frac{R}{2}$ such that the centre of cavity is at a distance R/2 from the centre of the sphere.A point mass m is placed inside the cavity at a distance R/4 from from the centre of sphere.The gravitational pull between the sphere and the point mass m is

(a) $11GMm/R^2$ (b) $14GMm/R^2$

(c) $GMm/2R^2$ (d) GMm/R^2

46. Which of the following combinations of Lissajous ' figure will be like eight (8) ?

(a) x=asin 4μt, y = bsin μt

(b) x= asin 2μt, y = bsin μt

(c) x = asin 2μt, y= bsin 2μt

(d) x= asin μt, y=bsin 4μt

47. The resultant of two rectangular sinle harmonic motions,of the same frequency and unequal amplitudes but differing in phase by ®/2 is

(a) simple harmonic (b) circular

(c) elliptical (d) parabolic

48. dU + ¢W = 0 is valid for

(a) adiabatic process

(b) isothermal process

(c) isobaric process

(d) isochoric process

49. The theory of refrigerator is based on

(a) joule-Thomson effect

(b) Newton's particle theory

(c) Joule's effect

(d) None of the above

50. Under the influence of weak magnetic field,normal Zeeman effect mighty be exhibited by

(a) H (b) He

JbigDeaL JbigDeaL JbigDeaL JbigDeaL Download from www.JbigDeaL.in Powered By © JbigDeaL JbigDeaL JbigDeaL JbigDeaL JbigDeaL

JbigDeaL JbigDeaL JbigDeaL JbigDeaL
Download from www.JbigDeaL.in Powered By © JbigDeaL™

(c) Na (d) K

JbigDeaL JbigDeaL JbigDeaL JbigDeaL Download from www.JbigDeaL.in Powered By © JbigDeaL JbigDeaL JbigDeaL JbigDeaL JbigDeaL